

WHAT IS CLAIMED

1. A labeled proteinoid microsphere comprising a mixture of amino acids that are condensed and a label comprising a fluorophore, a chemiluminescent molecule, a radioisotope, a paramagnetic ion, a metal, or an enzyme.
2. The labeled proteinoid microsphere of claim 1 wherein the label is barium sulfate, iocetamic acid, iopanoic acid, ipodate calcium, diatrizoate sodium, diatrizoate meglumine, metrizamide, tyropanoate sodium, fluorine-18, carbon-11, iodine-123, technitium-99m, iodine-131, indium-111, fluorine, gadolinium, fluorescein, isothiocyalate, rhodamine, pacific blue, phycoerythrin, phycocyanin, allophycocyanin, ophthaldehyde, fluorescamine, luminal, isoluminal, luciferin, luciferase or aequorin.
3. The labeled proteinoid microsphere of claim 1 wherein the proteinoid microsphere is formed by thermal condensation of a mixture of amino acids in the presence of a crosslinking agent.
4. The labeled proteinoid microsphere of claim 3 wherein the crosslinking agent is carbodiimide, glutaraldehyde, N-(m-maleimidobenzoyloxy)-succinimide, a bifunctional sulfhydryl reagent.
5. The labeled proteinoid microsphere of claim 1 that is used for signal amplification or diagnostic imaging.
6. The labeled proteinoid microsphere of claim 1 wherein the mixture of amino acids are thermally condensed.
7. A labeled proteinoid microsphere that is capable of binding to a specific target comprising a proteinoid microsphere linked to a label and a selective binding moiety that can bind to a specific target.

8. The labeled proteinoid microsphere of claim 6 wherein the label comprises a fluorophore, a chemiluminescent molecule, a radioisotope, a paramagnetic ion, a metal, or an enzyme.
9. The labeled proteinoid microsphere of claim 6 wherein the label is barium sulfate, iocetamic acid, iopanoic acid, ipodate calcium, diatrizoate sodium, diatrizoate meglumine, metrizamide, tyropanoate sodium, fluorine-18, carbon-11, iodine-123, technitium-99m, iodine-131, indium-111, fluorine, gadolinium, fluorescein, isothiocyalate, rhodamine, pacific blue, phycoerythrin, phycocyanin, allophycocyanin, ophthaldehyde, fluorescamine, luminal, isoluminal, luciferin, luciferase or aequorin.
10. The labeled proteinoid microsphere of claim 6 wherein the proteinoid microsphere is formed by thermal condensation of a mixture of amino acids in the presence of a crosslinking agent.
11. The labeled proteinoid microsphere of claim 9 wherein the crosslinking agent is carbodiimide, glutaraldehyde, N-(m-maleimidobenzoyloxy)-succinimide, a bifunctional sulfhydryl reagent.
12. The labeled proteinoid microsphere of claim 6 wherein the selective binding moiety is an antibody, a ligand, a receptor, a peptide, a peptidyl analogue or a polypeptide.
13. The labeled proteinoid microsphere of claim 6 that is used in an immunoassay.
14. The labeled proteinoid microsphere of claim 12 wherein the immunoassay is a radioimmunoassay, an ELISA, an immunofluorescence assay or a sandwich assay.

15. The labeled proteinoid microsphere of claim 6 that is used for diagnostic imaging or signal amplification.
16. The labeled proteinoid microsphere of claim 6 wherein the signal amplification is at least about thirty-fold relative to an antibody preparation linked to the same label.
17. A labeled proteinoid microsphere that is capable of binding to a specific target comprising a proteinoid microsphere linked to a label and an antibody that can bind to a specific target.
18. The labeled proteinoid microsphere of claim 17 wherein the proteinoid microsphere comprises a thermally-condensed mixture of amino acids comprising an acidic amino acid and a basic amino acid.
19. The labeled proteinoid microsphere of claim 17 wherein the label comprises a fluorophore, a chemiluminescent molecule, a radioisotope, a paramagnetic ion, a metal, or an enzyme.
20. The labeled proteinoid microsphere of claim 17 wherein the acidic amino acid is aspartic acid or glutamic acid or a mixture of both.
21. The labeled proteinoid microsphere of claim 17 wherein the basic amino acid is arginine or lysine, or a mixture of both.
22. The labeled proteinoid microsphere of claim 17 wherein the mixture of amino acids further comprises cysteine.